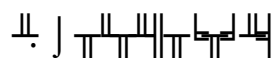
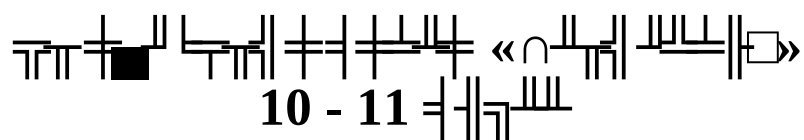


РАБОЧАЯ ПРОГРАММА



$$\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a) \quad \left(\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a) \right)$$

הצגת הבעיה

הבעיה היא להוכיח את הטענה הבאה: $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$. הטענה הזו היא אחת מהטענות הבסיסיות ביותר בתורת הפונקציות הכלליות.

1. $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$ עבור פונקציות רציפות.
2. $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$ עבור פונקציות רציפות.
3. $\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$ עבור פונקציות רציפות.

הוכחה: נניח כי f היא פונקציה רציפה. נגדיר $\delta(x-a)$ כפונקציה אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף. נניח כי ϕ היא פונקציה רציפה וחסומה, ונניח כי $\phi(x) = 0$ עבור $|x-a| > \epsilon$. נגדיר $\delta_\epsilon(x-a)$ כפונקציה רציפה וחסומה, אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף. נניח כי $\delta_\epsilon(x-a)$ היא פונקציה רציפה וחסומה, אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף.

נניח כי $\delta_\epsilon(x-a)$ היא פונקציה רציפה וחסומה, אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף. נניח כי $\delta_\epsilon(x-a)$ היא פונקציה רציפה וחסומה, אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף.

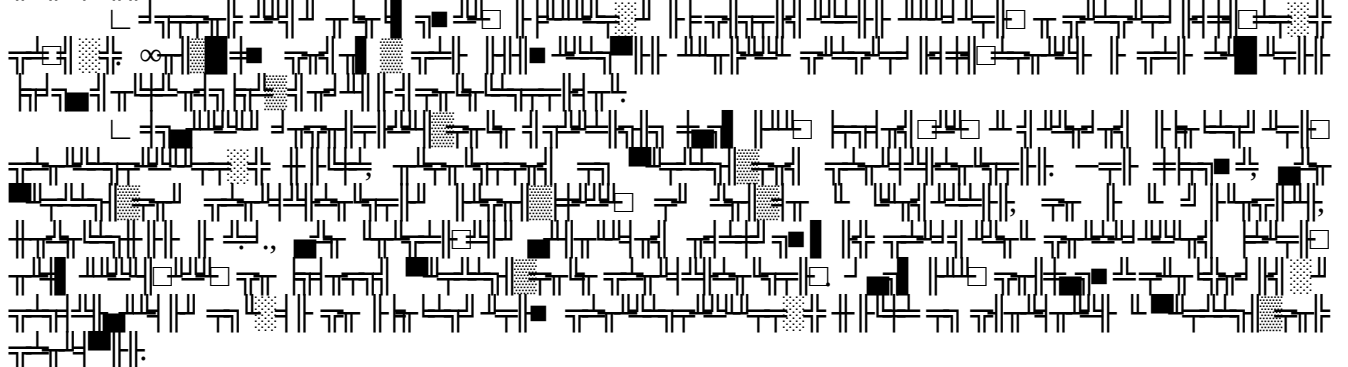
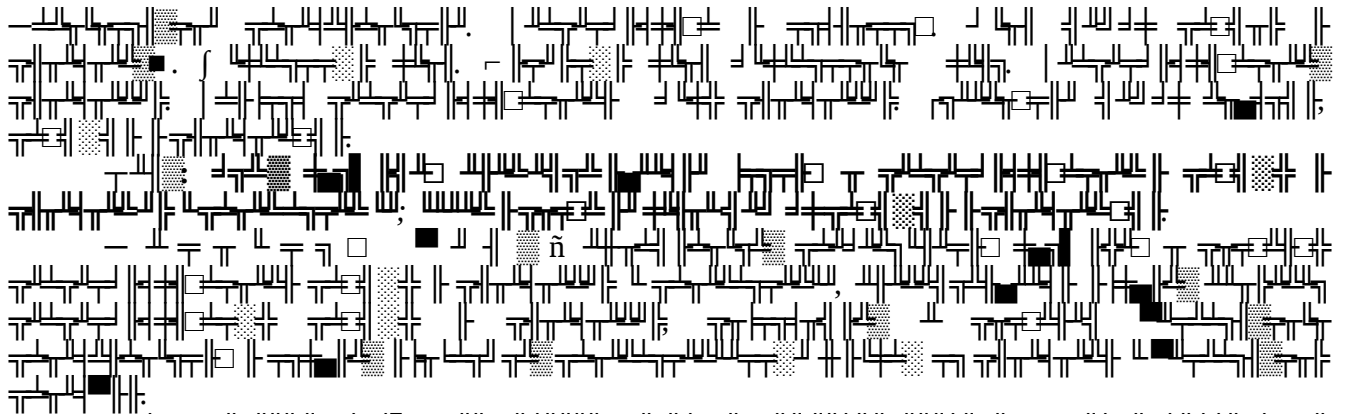
- $\int_{-\infty}^{\infty} f(x) \delta_\epsilon(x-a) dx \rightarrow f(a)$ כאשר $\epsilon \rightarrow 0$.
- $\int_{-\infty}^{\infty} f(x) \delta_\epsilon(x-a) dx \rightarrow f(a)$ כאשר $\epsilon \rightarrow 0$.
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$$\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a) \quad \left(\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a) \right)$$

$$\int_{-\infty}^{\infty} f(x) \delta(x-a) dx = f(a)$$

הוכחה: נניח כי f היא פונקציה רציפה. נגדיר $\delta(x-a)$ כפונקציה אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף. נניח כי ϕ היא פונקציה רציפה וחסומה, ונניח כי $\phi(x) = 0$ עבור $|x-a| > \epsilon$. נגדיר $\delta_\epsilon(x-a)$ כפונקציה רציפה וחסומה, אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף. נניח כי $\delta_\epsilon(x-a)$ היא פונקציה רציפה וחסומה, אשר מתאפסת בכל מקום פרט ל- a , שם היא שואפת לאינסוף.



4. (12).



5. (7).



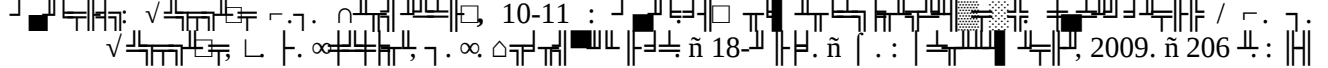
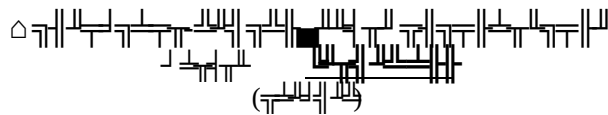
6. (5).

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1. $\triangle$ (16).

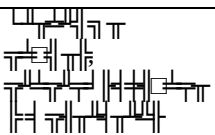
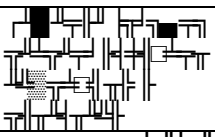
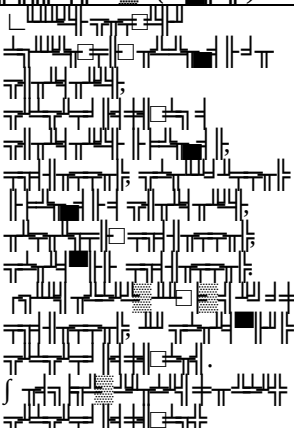
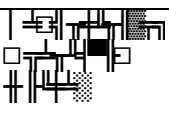
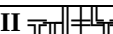
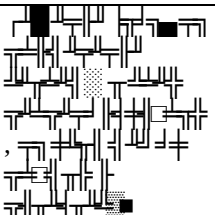
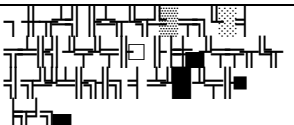
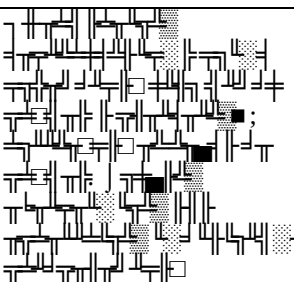
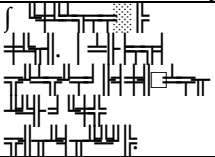
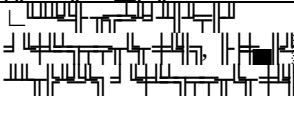
2. (17).

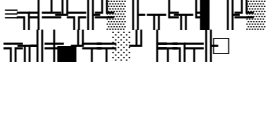
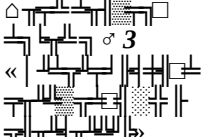
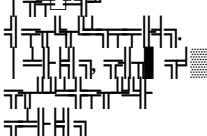
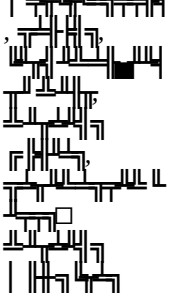
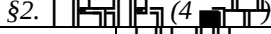
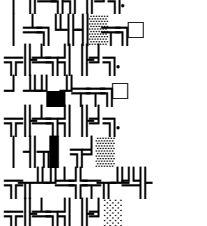
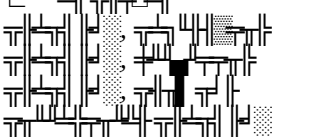
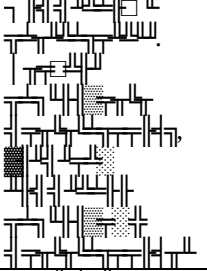
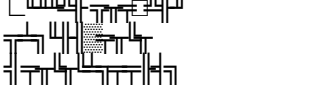
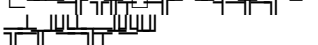
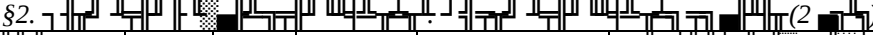
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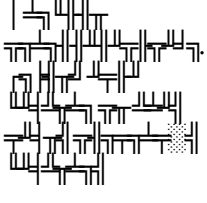
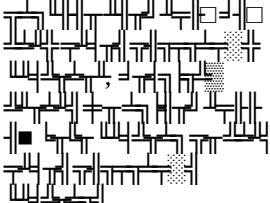
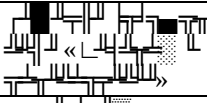
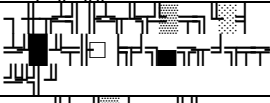
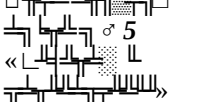
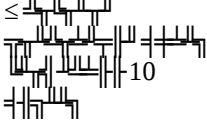
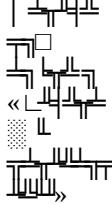


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7		6				
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1.3		1	14.09	
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1.5	♂ 1 «	1	28.09	
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1.6		2	29.09, 05.10	
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1.8		2	12.10, 13.10	
	§3.	2		
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1.11	♂ 2 «	1	27.10	
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2.2		1	09.11	
	§2.	4		
2.3		1	10.11	
2.4		1	16.11	
2.5		1	17.11	
2.6		2	23.11	
	§3	8		

2.7		1	24.11	
2.8		1	30.11	
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3.2		1		
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3.4		2		
	§3.—	7		
3.5		1		
3.6		1		
3.7		1		
3.8		1		
3.9		1		
3.10		1		
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	§4.—	7		
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3.13		1		
3.14		1		
3.15		2		
3.16		1		
3.17		1		
3.18	σ 3	1		
3.19	σ 4 «»	1		
4		14		
4.1		1		
4.2		1		
4.3		1		
4.4		1		
4.5		1		
4.6		1		

4.7	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.8	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.9	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.10	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.11	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.12	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.13	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
4.14	$\leq \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} \right)$	1		
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$$\begin{aligned} & \left| \frac{1}{n} \sum_{i=1}^n \left(\frac{1}{2} + \frac{1}{2} \right) \right| \leq \frac{1}{n} \sum_{i=1}^n \left(\frac{1}{2} + \frac{1}{2} \right) \\ & \left| \frac{1}{n} \sum_{i=1}^n \left(\frac{1}{2} + \frac{1}{2} \right) \right| \leq \frac{1}{n} \sum_{i=1}^n \left(\frac{1}{2} + \frac{1}{2} \right) \end{aligned}$$

Let $\{X_i\}_{i=1}^n$ be a sequence of independent random variables with $E[X_i] = 0$ and $\text{Var}(X_i) = 1$. Then, by the Central Limit Theorem, we have

$$\frac{1}{\sqrt{n}} \sum_{i=1}^n X_i \xrightarrow{d} N(0, 1)$$

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1. $\sqrt{\frac{1}{n}} \sum_{k=1}^n \frac{1}{k} \sim \ln n$ 10~11: $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$.
 $\sqrt{\frac{1}{n}} \sum_{k=1}^n \frac{1}{k} \sim \ln n$, $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$, 2009.
2. $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$ 10 $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$.
 $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$, 2008
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5. $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$ 11 $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$.
 $\lim_{n \rightarrow \infty} \frac{1}{n} \sum_{k=1}^n \frac{1}{k} = \int_0^1 \frac{1}{x} dx$, 2008.
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